Lifting module Shop-Floor

max. lifting force 1,000 to 6,000 N, stroke from 200 to 600 mm, manual-hydraulic and electro-mechanical version

Table of contents

1	**Manual-hydraulic version**	**1**
2	**Target group of this document**	**2**
3	**Electro-mechanical version**	**9**
4	**Index**	**19**

1 Manual-hydraulic version

Table of contents

1.1	Description	1
1.2	Validity of the documentation	1
2.1	Symbols and signal words	2
2.2	Safety instructions	2
2.3	Personal protective equipment	3
2.4	Safety devices	3
2.5	Application	4
2.6	Installation	4
2.7	Start up	5
2.8	Operation	5
2.9	Maintenance	6
2.10	Repair	7
2.11	Trouble shooting	7
2.12	Technical characteristics	7
2.13	Accessory	8
2.14	Disposal	8
2.15	Declaration of manufacture	8

1.1 Description

The lifting module Shop-Flor is particularly suitable for lifting and lowering assembly fixtures, working tables and demonstration objects in industrial applications as well as for medical treatment equipments in medical applications.

In general lifting modules are used as base unit of devices for controlled lifting and lowering of loads or for height adjustment only.

1.2 Validity of the documentation

This document applies to the following products:

Manual-hydraulic lifting modules of data sheet M 4.301.
The following types or part numbers are concerned:

- 8915-02-20-H, -30-H, -40-H, -50-H, -60-H
- 8915-04-20-H, -30-H, -40-H, -50-H, -60-H
- 8915-06-20-H, -30-H, -40-H, -50-H, -60-H

2 Target group of this document

- Specialists, fitters and set-up men of machines and installations with hydraulic expert knowledge.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An **expert** is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

2.1 Symbols and signal words

⚠ DANGER

Danger of life / heavy health damages

Stands for an imminent danger.

If it is not avoided, death or very severe injuries will result.

⚠ WARNING

Person damage

Stands for a possibly dangerous situation.

If it is not avoided, death or very severe injuries will result.

⚠ CAUTION

Easy injuries / property damage

Stands for a possibly dangerous situation.

If it is not avoided, minor injuries or material damages will result.

Hazardous to the environment

The symbol stands for important information for the proper handling with materials that are hazardous to the environment.
Ignoring these notes can lead to heavy damages to the environment.

Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

Note

This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

2.2 Safety instructions

2.2.1 Basic information

The operating instructions serve for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.

Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.

Furthermore, the consideration of the operating instructions will result in:

- reduced down times and repair costs,
- increased service life of the products.

Note

These operating instructions are not a replacement for the operating instructions of the entire machine.

2.2.2 General safety tips

⚠ WARNING

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

For handling with hydraulic oil consider the material safety data sheet.

Wear protection equipment.

⚠ WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

Improper connection and use can lead to escapes of oil under high pressure at the seals.

Mounting or dismounting of the element must only be made in depressurised mode.

Fixing has to be made in an appropriate way.

⚠ WARNING

Injury by crushing!

Components of the product make a movement while they are in operation.

This can cause injuries.

Keep parts of the body and items out of the working area!

⚠ CAUTION

Damage of components!

Side loads and forced conditions on the product lead to the premature failure.

Avoid forced conditions (overdetermination) of the product.

Max. forces and torques see technical characteristics.

⚠ CAUTION

Damage of components!

The admissible performance data of the product, see chapter "Technical characteristics", may not be exceeded.

⚠ CAUTION

Damage of components!

With hydraulic pressure very high forces are generated.

The fixture or machine must be in the position to compensate these forces.

⚠ CAUTION

Damage of components!

For cleaning / disinfection the plunger should be retracted to avoid degreasing of the plunger.

For cleaning / disinfection the environment temperature and the temperature of the cleaning agent of max. 70°C must not be exceeded.

The application of cold water immediately after cleaning / disinfection is not admissible.

⚠ CAUTION

Damage of components!

The product must not be cleaned with

- vacuum steam procedure, steam ray or high-pressure cleaner
- abrasives, scouring pads or other blunting materials
- cleaning agents with corrosive or caustic ingredients
- organic solvents as halogen or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), since this can damage the product.

▶ **Note - qualification of the user**

All works may only be effected by qualified personnel familiar with the handling of hydraulic components.

2.2.3 Warning

⚠ WARNING

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

Before start up, read the operating instructions!

2.3 Personal protective equipment

For works at and with the product, wear safety goggles!

For works at and with the product, wear protective gloves!

For works at and with the product, wear safety shoes!

2.4 Safety devices

The below safety devices are for the safety of the operators. As a matter of principle no safety devices may be detached, put out of action or modified.

Used safety devices

Figure 1: Positions of the safety devices

Mandatory sign "Read and follow the operation instructions"	o	Name plate with details of max. load, etc. (position can vary)

2.4.1 Check the safety devices

▶ **Note**

To check the safety device use the check lists "General examination" and / or "Functional testing". Eliminate immediately recognised defects at the safety devices.

Testing intervals

- at the beginning of every shift
- once a week in case of continuous shift
- after each maintenance or repair

Testing content

- Function
- State and position
- Safe fixing

General examination

Covers	Number, available and undamaged	
Screw plugs	Number, available and undamaged	
Name plates with specifications	Number, available, readable and undamaged	
Danger signs	Number, available and undamaged	
Mandatory signs	Number, available and undamaged	
Further safety devices available	available, undamaged and ready for operation	
Testing date:	Tester (signature):	

(Number see "Position of safety devices")

2.5 Application

2.5.1 Intended use

The products are used in industrial applications to transform hydraulic pressure to a linear movement and /or force. They must only be operated with hydraulic oil.

Furthermore the following belongs to possible uses:

- Use within the capacity indicated in the technical characteristics (see data sheet).
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

2.5.2 Misapplication

⚠ WARNING

Injuries, material damages or malfunctions!

Do not modify the product!

The use of these products is not admitted:

- For the domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to vibrations or other physical / chemical effects damages of the products or seals can be caused.
- On pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
  - For the use at fun fairs and in leisure parks.
  - In food processing or special hygiene regulations.
  - For military purposes.
  - In mines.
  - In explosive and aggressive environments (e.g. ATEX).
  - In medical engineering.
  - In the aerospace industry.
  - For passenger transport.
- For applications other than vertical lifting of loads. Hanging operation (e. g. from the ceiling) is inadmissible.

Special solutions are available on request!

2.6 Installation

2.6.1 Design

⚠ WARNING

Injury by falling parts!

Keep hands and other parts of the body out of the working area.

Wear personal protection equipment!

⚠ CAUTION

Damage of components!

Some product types have a considerable weight. These have to be secured against working free during transport.

Weight specifications see chapter "Technical characteristics".

⚠ CAUTION

Damage of components!

Side loads and forced conditions on the product lead to the premature failure.

Avoid forced conditions (overdetermination) of the product.

Max. forces and torques see technical characteristics.

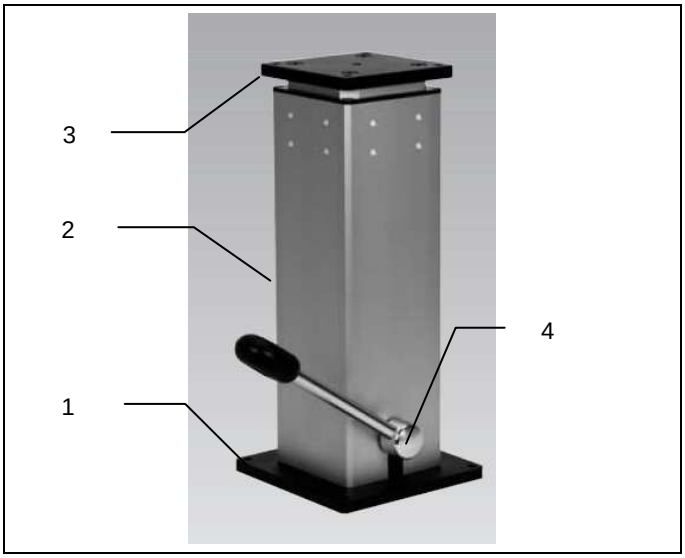

Figure 2: components

1	Bottom plate	3	Top plate
2	Guide unit	4	Lifting jack with foot pedal

2.6.2 Fixing of the product

⚠ WARNING

Injury due to overturning product!

Overturning product due to missing or incorrect fixing!

Fasten bottom plate on the floor.

When introducing torques within the load limit (see technical characteristics) we recommend to use an additional base plate (accessory) and to secure this plate correctly.

⚠ CAUTION

Damage of components!

Foot pedal is pressed down below the lower edge of the base plate.

The customer has to make sure that this will be prevented by the concrete floor or a corresponding base plate connecting construction.

1. Install the product so that for the required cleaning and maintenance works there is all around a clearance zone of at least 700 mm.
2. The product has to be mounted horizontally on a plane and solid concrete floor (concrete strength grade B 25) or a rigid connecting construction of the customer (flatness 0.20 mm).
3. Fasten the bottom plate of the product with hexagon socket head cap screws ISO 4762 - M10 onto the concrete floor or the connecting construction of the customer.
4. For this purpose professionally insert into the concrete floor heavy-duty dowels (e.g. Fischer part-no.: SL M-10 N).

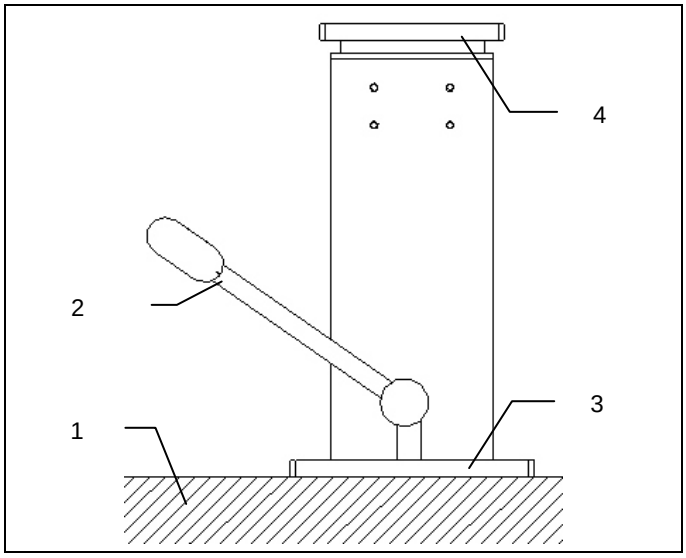

Figure 3: principle of fixing

1 Concrete floor or connecting construction	3 Bottom plate
2 Foot pedal	4 Top plate

2.6.3 Mounting of the customer's connecting construction

⚠ WARNING

Injury due to overturning product!

Overturning product due to eccentric load provided by the user!

The centre of gravity of the user's load must be within the 4 fixing screws of the bottom plate.

When introducing torques within the load limit (see technical characteristics) we recommend to use an additional base plate (accessory) and to secure this plate correctly.

1. For fixing of the customer's connecting construction there are 4 bore holes (for M10 - ∅ 10.5 mm) at the top plate.
   All provided bore holes have to be used!
2. Fasten the connecting construction at the top plate.

Note

Dangers due to the connecting construction of the customer, as e.g. squeezing points have to be excluded by the customer's design.

2.7 Start up

⚠ WARNING

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

For handling with hydraulic oil consider the material safety data sheet.

Wear protection equipment.

1. Check tight seat (check tightening torque of the fixing screws).

2.8 Operation

⚠ WARNING

Injuries due to non-compliance of the operating instructions!

The product may only be operated, if the operating instructions - especially the chapter "Safety instructions" have been read and understood.

⚠ WARNING

Injury by crushing!

Components of the product make a movement while they are in operation.

This can cause injuries.

Keep parts of the body and items out of the working area!

⚠ WARNING

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

Before start up, read the operating instructions!

The operator is obliged to report immediately any changes at the product that may affect the safety to the safety expert or to the person who is responsible for safety and to stop operating the product.

2.8.1 Working place

The working place is designed in front of the lifting module.

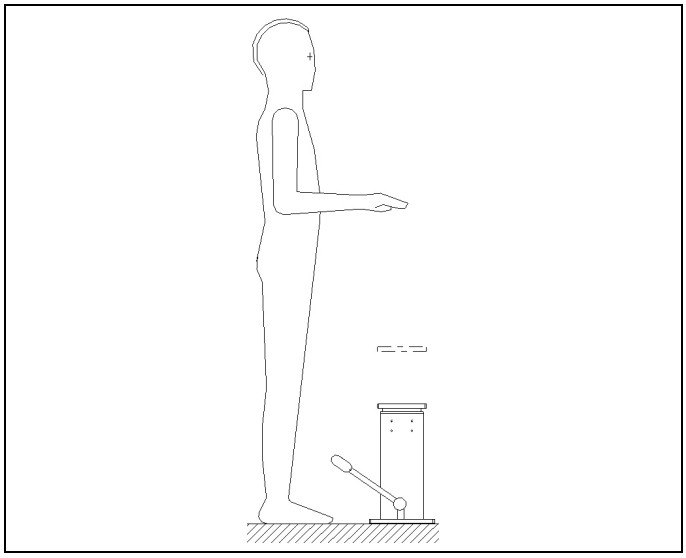

Figure 4: working place

2.8.2 Behaviour in an emergency

In emergencies the product may not be operated.

2.8.3 Lifting

The stroke movement is produced by the internal, hermetically-sealed, hydraulic lifting jack with foot pedal with oil being pumped by means of a piston into a plunger cylinder.

To lift the top plate, the foot pedal has to be depressed by approx. 40° several times. The pedal returns to its off-position by means of a return spring.

2.8.4 Lowering

To lower the top plate, the foot pedal has to be pressed upwards by approx. 10°. Thereby the oil returns due to the weight of the user's load from the plunger cylinder into the reservoir, the top plate lowers.

2.9 Maintenance

2.9.1 Plan for maintenance

Maintenance works	Interval	by...
Cleaning, visual check of the lifting module and inspection of the guide unit	daily	operator
Control of the fixing screws, retighten if required. Control of the guide unit	half-yearly checks	expert
Check smooth running with little load over the entire stroke range	yearly	expert
Check smooth running with load over the entire stroke range	yearly	expert
Check the check valve of the internal lifting jack with load	yearly	expert
Revision by the manufacturer (recommendation)	after 50,000 cycles (lifting and lowering)	ROEMHELD service staff
Repair	in case of damages	ROEMHELD service staff

Note

Pay attention to the qualification of the personnel.

2.9.2 Cleaning

⚠ WARNING

Danger of injury due to a lifting or lowering movement!

Do not reach into the stroke area during the lifting or lowering movement.

The following cleaning works have to be effected daily at the mechanical components.

1. Clean with cleaning clothes or cleaning rags.
2. Slightly lubricate the metallic components (plates, guides, etc.).

2.9.3 Daily checks

⚠ WARNING

Danger of injury due to a lifting or lowering movement!

Do not reach into the stroke area during the lifting or lowering movement.

- Visual check of the lifting module
- Check the guide unit for damages and possible running marks, repair if required.

2.9.4 Half-yearly checks

⚠ WARNING

Injury due to a lifting or lowering movement!

Before cleaning switch off power supply.

- Check all fixing screws of the lifting module, retighten if required.
- Check all cable fixings and fittings, retighten if required.
- Check the wear of the guide unit based on the guiding clearance. If the clearance exceeds 0.5 mm, the guiding elements have to be exchanged. (See chapter repair).

2.9.5 Yearly checks

To maintain the product in a safe condition and ready for operation, the function safety of the internal lifting jack has to be checked annually by an expert (see maintenance schedule).

2.9.6 Check smooth running of the product with little load over the entire stroke range

⚠ CAUTION

Damage of components!

If smooth running of the product does not work perfectly, even if only partial stroke ranges are affected, the product must no longer be used.

Observe the checking intervals.

- Press the foot pedal upwards until the top plate is completely lowered.
- Fix the test weight at the top plate (10% of the nominal load).
- Depress the foot pedal several times until the top plate is completely lifted.
- Press the foot pedal upwards until the top plate is completely lowered.

2.9.7 Check smooth running of the product with load over the entire stroke range

⚠ CAUTION

Damage of components!

If smooth running of the product does not work perfectly, even if only partial stroke ranges are affected, the product must no longer be used.

Observe the checking intervals.

- Press the foot pedal upwards until the top plate is completely lowered.
- Fix the test weight at the top plate (nominal load).
- Depress the foot pedal several times until the top plate is completely lifted.
- Press the foot pedal upwards until the top plate is completely lowered.

2.9.8 Check the check valve of the internal lifting jack with load

Note

If the top plate of the product lowers independently, it may no longer be operated!

- Press the foot pedal upwards until the top plate is completely lowered.
- Fix the test weight at the top plate (nominal load).
- Depress the foot pedal several times until the top plate is completely lifted.
- Top plate may not lower independently

2.10 Repair

Note

Repair works, as e.g. the change of the interior lifting jack may only be effected by the ROEMHELD service technicians.

2.11 Trouble shooting

⚠ CAUTION

Damage of components!

All works only to be effected by ROEMHELD service staff.

Trouble	Cause	Remedy
Top plate does not lift or lower after the operation of the foot pedal	Internal lifting jack defect	Replace internal lifting jack
Top plate lowers without operation of the foot pedal	Internal lifting jack defect	Replace internal lifting jack

2.12 Technical characteristics

Max. lifting force	2000, 4000, 6000 N
Stroke	200, 300, 400, 500, 600 mm
Function	Manual-hydraulic
Operation	Foot pedal
Lifting profile	Aluminium, colourless anodised
Top and bottom plate	aluminium, black anodised

Type	Lifting force [N]	Pump strokes per 100 mm	Descent speed [mm/s]
8915-02-XX-H	2000	5	45
8915-04-XX-H	4000	7	22
8915-06-XX-H	6000	10	22

Type	Stroke [mm]	Weight [kg]
8915-XX-20-H	200	15
8915-XX-30-H	300	20
8915-XX-40-H	400	25
8915-XX-50-H	500	30
8915-XX-60-H	600	35

Side loads

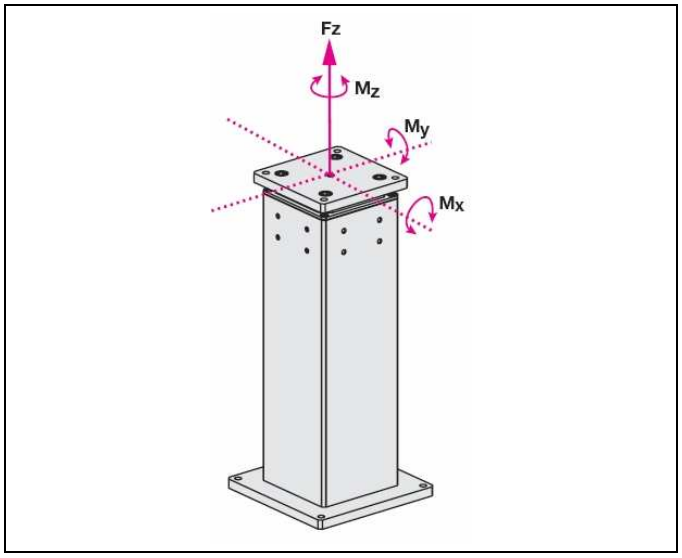

Figure 5: Side loads

Max. load torque M_z	300 Nm
Max. load torque M_x or M_y	500 Nm

Tightening torques

The tightening torques for the fixing screws of the customer's connecting construction are to be taken from the VDI guideline 2230.

Emissions

The A valued continuous sound level is less than 75 dB(A) in operation.

2.13 Accessory

Base plate for increased stability	
Part-no.	6311-412
Data sheet	M 8.100
Further accessories	M 8.110, M 8.130, M 8.131

2.14 Disposal

Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised expert company.

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions.

Special attention has to be drawn to the disposal of components with residual portions of hydraulic fluids. The instructions for the disposal at the material safety data sheet have to be considered.

For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

2.15 Declaration of manufacture

Manufacturer

Römheld GmbH Friedrichshütte
Römheldstraße 1-5
35321 Laubach, Germany
Tel.: +49 (0) 64 05 / 89-0
Fax: +49 (0) 64 05 / 89-211
E-mail: info@roemheld.de
www.roemheld.com

2.15.1 Validity of the documentation

This document applies to the following products:

Manual-hydraulic lifting modules of data sheet M 4.301.
The following types or part numbers are concerned:

- 8915-02-20-H, -30-H, -40-H, -50-H, -60-H
- 8915-04-20-H, -30-H, -40-H, -50-H, -60-H
- 8915-06-20-H, -30-H, -40-H, -50-H, -60-H

They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC** (EC MSRL) and in compliance with the valid technical rules and standards.
In accordance with EC-MSRL and EN 982, these products are components that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine/machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request.
The technical documentation as per appendix VII part B was prepared for the products.

2.15.2 List of the applied standards

2001/95/EC, General product safety

92/58/EEC, Minimum requirements for the provision of safety and/or health signs at work

89/391/EEC, Introduction of measures to encourage improvements in the safety and health of workers at work

89/655/EEC, Minimum safety and health requirements for the use by workers of personal protective equipment at the workplace

Operating safety regulations (BetrSichV) for the transposal of the directive on the introduction of measures to encourage improvements in the safety and health of workers at work. (German implementation of the Work Equipment Directive 89/655/EEC)

Product Safety Act - PSG; November 2011

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 1 and 2)

DIN EN ISO 13857; 2008-06, Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs. (replaces: DIN EN 294)

DIN EN 349, 2008-09, Safety of machinery. Minimum gaps to avoid crushing of parts of the human body

DIN EN 614-1 a. 2, 2009-06, Safety of machinery - Ergonomic design principles

DIN EN 626-1, 2008-09, Safety of machinery - Reduction of risks to health from hazardous substances emitted by machinery

DIN EN ISO 4413, 2011-04, Hydraulic fluid power - General rules and safety requirements for systems and their components

DIN EN 1037, 2008-11, safety of machinery - prevention of unexpected start-up.

DIN EN 81714-2, 2007-08, Design of graphical symbols for use in the technical documentation of products

Responsible person for the documentation:
Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

Römheld GmbH
Friedrichshütte
Laubach, 28.09.2012

3 Electro-mechanical version

Table of contents

3.1 Description 10
3.2 Validity of the documentation 10
3.3 Target group of this document 10
3.4 Symbols and signal words 10
3.5 Safety instructions 10
3.6 Personal protective equipment 11
3.7 Safety devices 11
3.8 Application 12
3.9 Installation 12
3.10 Design 12
3.11 Start up 14
3.12 Operation 14
3.13 Maintenance 15
3.14 Repair 16
3.15 Trouble shooting 16
3.16 Technical characteristics 16
3.17 Accessory 17
3.18 Disposal 17
3.19 EC-Declaration of conformity 17

3.1 Description

The lifting motion is generated by an electric motor with a spindle lifting gear.

The electrically operated variant is particularly suitable for positioning and adjusting tasks of working tables as well as for material supply and transport.

It excels by a smooth running.

Operation

Lifting and lowering is triggered by push-buttons with touch control contact. After release of the push-button, the motion will be immediately stopped.

Synchronization

Up to 4 lifting modules can be operated with synchronization control by a corresponding supply unit.

For example complete lifting platforms can be designed.

For operation with synchronization control only lifting modules with identification letter G are suitable.

Supply units with synchronization control for 2, 3, or 4 lifting modules are available.

3.2 Validity of the documentation

This document applies to the following products:

Electro-mechanical lifting modules of data sheet M 4.301.
The following types or part numbers are concerned:

- 8915-01-20-E, -30-E, -40-E, -50-E, -60-E
- 8915-02-20-E, -30-E, -40-E, -50-E, -60-E
- 8915-04-20-E, -30-E, -40-E, -50-E, -60-E
- 8915-06-20-E, -30-E, -40-E, -50-E, -60-E

- 8915-02-20-G, -30-G, -40-G, -50-G, -60-G
- 8915-04-20-G, -30-G, -40-G, -50-G, -60-G
- 8915-06-20-G, -30-G, -40-G, -50-G, -60-G

3.3 Target group of this document

- Experts for installation and maintenance with electro-mechanical know-how.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An **expert** is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,
- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

3.4 Symbols and signal words

⚠ DANGER

Danger of life / heavy health damages

Stands for an imminent danger.

If it is not avoided, death or very severe injuries will result.

⚠ WARNING

Person damage

Stands for a possibly dangerous situation.

If it is not avoided, death or very severe injuries will result.

⚠ CAUTION

Easy injuries / property damage

Stands for a possibly dangerous situation.

If it is not avoided, minor injuries or material damages will result.

Hazardous to the environment

The symbol stands for important information for the proper handling with materials that are hazardous to the environment.
Ignoring these notes can lead to heavy damages to the environment.

Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

Note

This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

3.5 Safety instructions

3.5.1 Basic information

The operating instructions serve for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.

Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.

Furthermore, the consideration of the operating instructions will result in:

- reduced down times and repair costs,
- increased service life of the products.

Note

These operating instructions are not a replacement for the operating instructions of the entire machine.

3.5.2 General safety tips

⚠ WARNING

Injuries, material damages or malfunctions!

Do not modify the product!

⚠ WARNING

Injury / burning due to contact with energized parts!

Before working on electric equipment, the energized parts must be de-energized and secured.

Do not open protection covers at electric parts.

All electrical works must only be realised by electricians.

⚠ WARNING

Injury by crushing!

Components of the product make a movement while they are in operation.

This can cause injuries.

Keep parts of the body and items out of the working area!

⚠ WARNING

Injury due to a lifting or lowering movement!

Before cleaning switch off power supply.

⚠ CAUTION

Damage of components!

Side loads and forced conditions on the product lead to the premature failure.

Avoid forced conditions (overdetermination) of the product.

Max. forces and torques see technical characteristics.

⚠ CAUTION

Damage of components!

The admissible performance data of the product, see chapter "Technical characteristics", may not be exceeded.

⚠ CAUTION

Damage of components!

The cable must be fixed by the user so that no bending and tensile stresses will act on the cable and that the cable cannot be damaged.

▶ **Note - qualification of the user**

Repair works, as e.g. the change of electrical or hydraulic components may only be effected by the service technicians of the company Römheld.

3.5.3 Warning

⚠ WARNING

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

Before start up, read the operating instructions!

3.6 Personal protective equipment

For works at and with the product, wear safety goggles!

For works at and with the product, wear protective gloves!

For works at and with the product, wear safety shoes!

3.7 Safety devices

The below safety devices are for the safety of the operators. As a matter of principle no safety devices may be detached, put out of action or modified.

Used safety devices

Figure 6: Positions of the safety devices

Mandatory sign "Read and follow the operation instructions"		o	Name plate with details of max. load, etc. (position can vary)

3.7.1 Check the safety devices

Note

To check the safety device use the check lists "General examination" and / or "Functional testing". Eliminate immediately recognised defects at the safety devices.

Testing intervals

- at the beginning of every shift
- once a week in case of continuous shift
- after each maintenance or repair

Testing content

- Function
- State and position
- Safe fixing

General examination

Covers	Number, available and undamaged	
Screw plugs	Number, available and undamaged	
Name plates with specifications	Number, available, readable and undamaged	
Danger signs	Number, available and undamaged	
Mandatory signs	Number, available and undamaged	
Further safety devices available	available, undamaged and ready for operation	
Testing date:	Tester (signature):	

(Number see "Position of safety devices")

3.8 Application

3.8.1 Intended use

The products are used in industrial applications to effect occasional lifting and lowering movements with an electric motor.

Furthermore the following belongs to possible uses:

- Max. pressure load only within the lifting force indicated below technical characteristics.
- Position of the gravity centre of the load within the top plate.
- Use only within closed, low-dust rooms
- Use within the capacity indicated in the technical characteristics, pay special attention to the torque load.
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

3.8.2 Misapplication

⚠ WARNING

Injuries, material damages or malfunctions!

Do not modify the product!

The use of these products is not admitted:

- For the domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to vibrations or other physical / chemical effects damages of the products or seals can be caused.
- On pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
  - For the use at fun fairs and in leisure parks.
  - In food processing or special hygiene regulations.
  - For military purposes.
  - In mines.
  - In explosive and aggressive environments (e.g. ATEX).
  - In medical engineering.
  - In the aerospace industry.
  - For passenger transport.
- For applications other than vertical lifting of loads. Hanging operation (e. g. from the ceiling) is inadmissible.
- Not suitable for applications with strong impact loads or strong vibration.

Special solutions are available on request!

3.9 Installation

3.10 Design

⚠ WARNING

Injury by falling parts!

Keep hands and other parts of the body out of the working area.

Wear personal protection equipment!

⚠ CAUTION

Damage of components!

Some product types have a considerable weight. These have to be secured against working free during transport.

Weight specifications see chapter "Technical characteristics".

⚠ CAUTION

Damage of components!

Side loads and forced conditions on the product lead to the premature failure.

Avoid forced conditions (overdetermination) of the product.

Max. forces and torques see technical characteristics.

Figure 7: components

1	Bottom plate	3	Top plate
2	Guide unit	4	Linear actuator with connecting cable

3.10.1 Fixing of the product

⚠ WARNING

Injury due to overturning product!

Overturning product due to missing or incorrect fixing!

Fasten bottom plate on the floor.

When introducing torques within the load limit (see technical characteristics) we recommend to use an additional base plate (accessory) and to secure this plate correctly.

1. Install the product so that for the required cleaning and maintenance works there is all around a clearance zone of at least 700 mm.
2. The product has to be mounted horizontally on a plane and solid concrete floor (concrete strength grade B 25) or a rigid connecting construction of the customer (flatness 0.20 mm).
3. Fasten the bottom plate of the product with hexagon socket head cap screws ISO 4762 - M10 onto the concrete floor or the connecting construction of the customer.
4. For this purpose professionally insert into the concrete floor heavy-duty dowels (e.g. Fischer part-no.: SL M-10 N).

Note

- When using several lifting modules designed for synchronization control also the following conditions must be fulfilled.
- All lifting modules must be arranged parallel to each other and aligned. Especially in case of high loads on the equipment, considerable friction forces can occur in case of insufficient parallelism due to deformation of the equipment which can impair the functioning.
- The load must be located so that a small difference in height of the lifting modules cannot lead to a possible danger of persons or forced conditions between the lifting modules. It has particularly to be considered that differences in height can lead to a shortening of the effective distance and thereby to inadmissible transverse forces! Therefore a bearing with longitudinal compensation or elastic buffer is recommended.

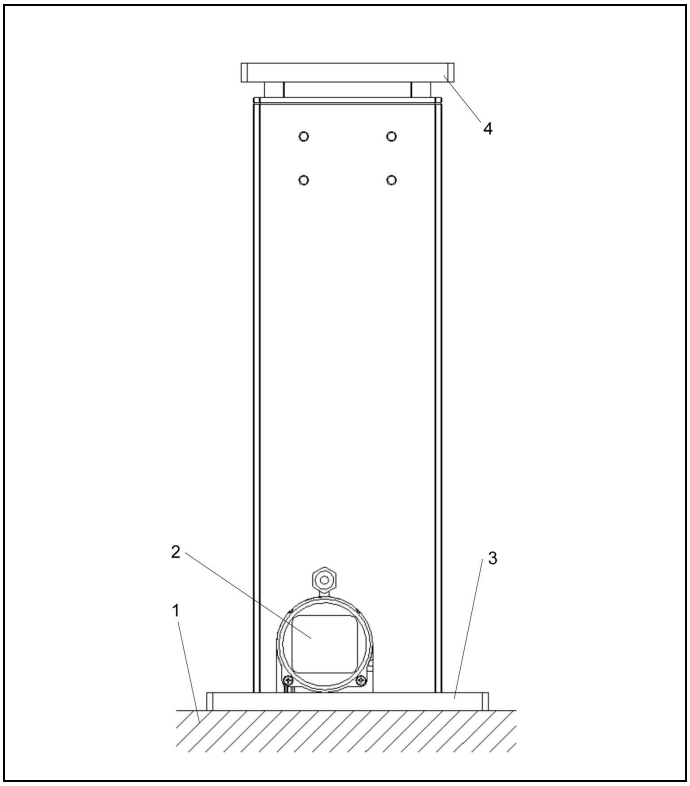

Figure 8: principle of fixing

1	Concrete floor or connecting construction	3	Bottom plate
2	Linear unit	4	Top plate

3.10.2 Mounting of the customer's connecting construction

⚠ WARNING

Injury due to overturning product!

Overturning product due to eccentric load provided by the user!

The centre of gravity of the user's load must be within the 4 fixing screws of the bottom plate.

When introducing torques within the load limit (see technical characteristics) we recommend to use an additional base plate (accessory) and to secure this plate correctly.

1. For fixing of the customer's connecting construction there are 4 bore holes (for M10 - ∅ 10.5 mm) at the top plate.
   All provided bore holes have to be used!
2. Fasten the connecting construction at the top plate.

Note

Dangers due to the connecting construction of the customer, as e.g. squeezing points have to be excluded by the customer's design.

3.11 Start up

⚠ WARNING

Injury / burning due to contact with energized parts!

Before working on electric equipment, the energized parts must be de-energized and secured.

Do not open protection covers at electric parts.

All electrical works must only be realised by electricians.

Check tight seat (check seating torque of the fixing screws).

To operate the lifting modules one of the supply units listed in the following, a hand panel or foot switch and a mains cable is required.

Note

- The lifting modules must only be used in conjunction with the components which belong to the system. Components, which do not belong to the system or not permitted devices must under no circumstances be connected.

Supply units (lines):

- 3821-24X (for version 8911-0X-X0-E)
- 3821-4XX (for version 8911-0X-X0-G)

Hand panel:

- 3823-025

Foot switch:

- 3823-029

Mains cables:

- 3823-040

Note

- For the connection of the operating elements and the mains cable as well as the pin assignment see operating instructions BA M8200.

1 Connection of the lifting module to the supply unit. The cable bushing of the lifting module must be put into the provided plug connector in the housing of the supply and control unit. Then the screw of the cable bushing has to be tightened with a torque of 0.4 Nm.

2 Correct fixing of the supply unit near the lifting module.

3.12 Operation

⚠ WARNING

Injuries due to non-compliance of the operating instructions!

The product may only be operated, if the operating instructions - especially the chapter "Safety instructions" have been read and understood.

⚠ WARNING

Injury by crushing!

Components of the product make a movement while they are in operation.

This can cause injuries.

Keep parts of the body and items out of the working area!

⚠ WARNING

Injuries due to misuse, incorrect operation or abuse!

Injuries can occur if the product is not used within the intended use and the technical performance data.

Before start up, read the operating instructions!

The operator is obliged to report immediately any changes at the product that may affect the safety to the safety expert or to the person who is responsible for safety and to stop operating the product.

3.12.1 Working place

The working place is designed in front of the lifting module.

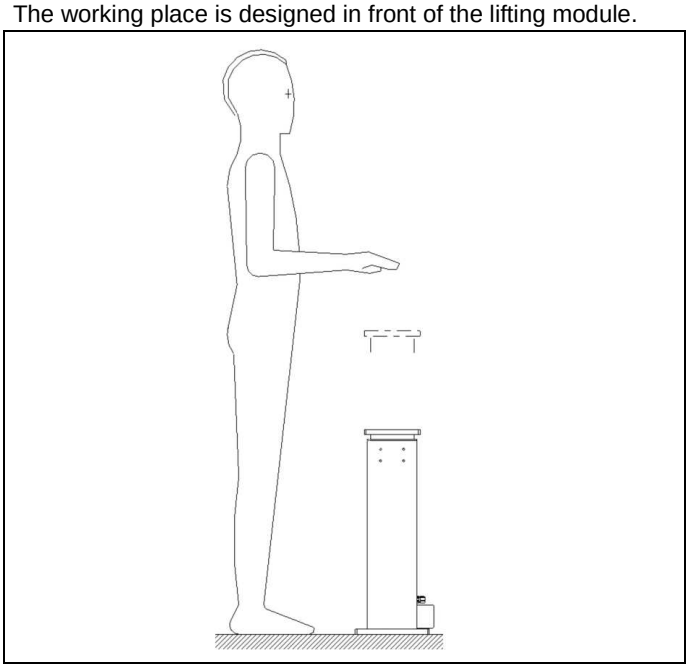

Figure 9: working place

3.12.2 Behaviour in an emergency

In emergencies the product may not be operated.

3.12.3 Lifting and lowering

By operating the direction key lifting (↑) or lowering (↓) at the hand panel or foot switch the lifting module will be extended or retracted. Due to the touch control, the respective direction key must remain actuated during the lifting or lowering.

An electronic current limitation in the supply unit protects the lifting module against overload. If for example in case of overload the lifting module is working longer than 1 second in the range of the current limitation, the lifting module will be switched off. The function is restored after release of the push-button operation.

Figure 10: hand panel and foot switch

3.13 Maintenance

3.13.1 Service life

The service life is:

250 operating hours (only time required for stroke) for the units 2 kN and 4 kN with duty cycle 15%, 1.5 min ON

60 operating hours (only time required for stroke) for the units 6 kN with duty cycle 15%, 1.5 min ON

3.13.2 Plan for maintenance

Maintenance works	Interval	by...
Cleaning, visual check of the lifting module and inspection of the guide unit	daily	operator
Check all fixing screws and cable fixings and fittings, retighten if required. control of the guide unit	half-yearly checks	expert
The electrical components of the lifting module are to be checked by an expert at regular intervals, but at least once a year.	yearly checks	expert
Repair	in case of damages	ROEMHELD service staff

Note

Pay attention to the qualification of the personnel.

3.13.3 Cleaning

⚠ WARNING

Danger of injury due to a lifting or lowering movement!

Do not reach into the stroke area during the lifting or lowering movement.

The following cleaning works have to be effected daily at the mechanical components.

1. Clean with cleaning clothes or cleaning rags.
2. Slightly lubricate the metallic components (plates, guides, etc.).

3.13.4 Daily checks

⚠ WARNING

Injury due to a lifting or lowering movement!

Before cleaning switch off power supply.

- Visual check of the lifting module
- Check the guide unit for damages and possible running marks, repair if required.

3.13.5 Half-yearly checks

⚠ WARNING

Injury due to a lifting or lowering movement!

Before cleaning switch off power supply.

- Check all fixing screws of the lifting module, retighten if required.
- Check the wear of the guide unit based on the guiding clearance. If the clearance exceeds 0.5 mm, the guiding elements have to be exchanged. (See chapter Repair).

3.13.6 Yearly checks

⚠ WARNING

Injury due to a lifting or lowering movement!

Before cleaning switch off power supply.

The electrical components of the lifting module are to be checked by an expert at regular intervals, but at least once a year. The check includes:

- The perfect functioning
- The state of the component
- Check as per BGV A3

3.14 Repair

Repair works, as e.g. the change of internal linear actuator may only be effected by the service technicians of the company Römheld.

3.15 Trouble shooting

⚠ CAUTION

Damage of components!

All works only to be effected by ROEMHELD service staff.

Trouble	Cause	Remedy
Top plate does not lift or lower after the operation of the push-button	Interior linear actuator defect	Linear actuator to be replaced by ROEMHELD service personnel
Top plate lowers without operation of the push-button	Interior linear actuator defect	Linear actuator to be replaced by ROEMHELD service personnel

3.16 Technical characteristics

Max. lifting force	1000, 2000, 4000, 6000 N
Stroke	200, 300, 400, 500, 600 mm
Function	Electrical
Duty cycle	15% 1.5 min. ON
Code class	IP 54
Control voltage	24VDC
Protection class	II ⧈
Operation	Hand panel or foot pedal
Lifting profile	Aluminium, colourless anodised
Top and bottom plate	Aluminium, black anodised

Variante E = not suitable for synchronization

Type	Lifting force [N]	v_H [mm/s]	I [A]
8915-01-XX-E	1000	32 … 28	7
8915-02-XX-E	2000	18 … 16	6
8915-04-XX-E	4000	10 … 8	6
8915-06-XX-E	6000	7 … 5	7,5

Variante G = suitable for synchronization

Type	Lifting force [N]	v_H [mm/s]	I [A]
8915-02-XX-G	2000	18 … 16	6
8915-04-XX-G	4000	8 … 6	4,5
8915-06-XX-G	6000	6 … 4	5,5

v_H	=	Lifting speed. load-dependent:
I	=	Current consumption, load-dependent

Variante E and G

Type	Stroke [mm]	Weight [kg]
8915-XX-20-X	200	14
8915-XX-30-X	300	16
8915-XX-40-X	400	19
8915-XX-50-X	500	21
8915-XX-60-X	600	24

Side loads

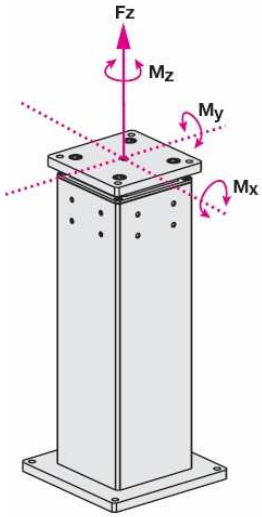

Figure 11: Side loads

Max. load torque M_z	300 Nm
Max. load torque M_x or M_y	500 Nm

Tightening torques

The tightening torques for the fixing screws of the customer's connecting construction are to be taken from the VDI guideline 2230.

Emissions

The A valued continuous sound level is less than 75 dB(A) in operation.

Circuit diagrams:

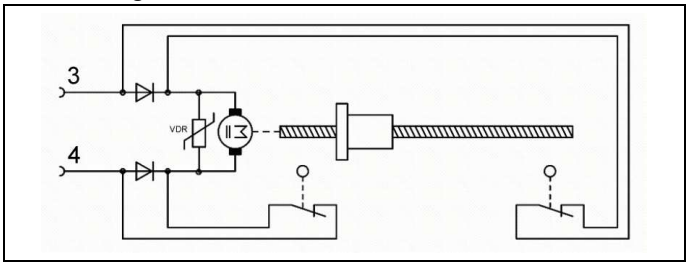

Figure 12: Lifting module standard (8915-0X-X0-E)

3 brown + (extend) - (retract)	4 blue - (extend) + (retract)

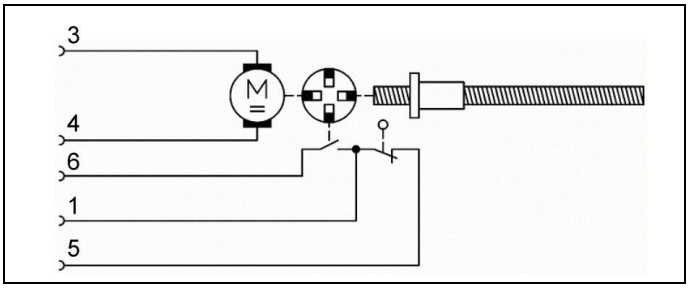

Figure 13: Lifting module with incremental measuring system (8915-0X-X0-G)

3 brown + (extend) - (retract)	6 red = pulse generator
	1 yellow = COM
4 blue - (extend) + (retract)	5 black = limit switch

3.17 Accessory

Base plate for increased stability	
Part-no.	6311-412
Data sheet	M 8.100
Further accessories	M 8.110, M 8.130, M 8.131

3.18 Disposal

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions.

For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised expert company.

3.19 EC-Declaration of conformity

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3.19.1 Validity of the documentation

This document applies to the following products:

Electro-mechanical lifting modules of data sheet M 4.301.
The following types or part numbers are concerned:

- 8915-01-20-E, -30-E, -40-E, -50-E, -60-E
- 8915-02-20-E, -30-E, -40-E, -50-E, -60-E
- 8915-04-20-E, -30-E, -40-E, -50-E, -60-E
- 8915-06-20-E, -30-E, -40-E, -50-E, -60-E

- 8915-02-20-G, -30-G, -40-G, -50-G, -60-G
- 8915-04-20-G, -30-G, -40-G, -50-G, -60-G
- 8915-06-20-G, -30-G, -40-G, -50-G, -60-G

The indicated products have been designed and manufactured in compliance with **CE directive 2004/108/CE – EMC** directive (directive on electromagnetic compatibility) according to their current version and the additionally applicable technical rules.

According to EG MSRL and EN 982, these products are components which are not ready for use and exclusively intended for installation in an incomplete machine / machine.

The products must not be put in operation, before it has been verified that the incomplete machine / machine into which the products are to be installed complies with the provisions of the machinery directive (2006/42/CE).

The manufacturer is obliged to provide the relevant documentation for the products to state agencies upon request.

The technical documentation for the products as per Annex IV has been prepared.

3.19.2 List of the applied standards

2006/42/EC Machinery Directive

2002/95/EC, Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

DIN EN 349, 2008-09, Safety of machinery. Minimum gaps to avoid crushing of parts of the human body

DIN EN 1494; 2009-05, Mobile or movable jacks and associated lifting equipment

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 1 and 2)

DIN EN ISO 14121-1, 2007-12, Safety of machinery- Risk assessment- Part 1: Principles

DIN EN 60529; 2000-09, Degrees of protection provided by enclosures (IP- Codes)

DIN EN 60204-1; 2007-06, Safety of machinery - Electrical equipment of machines, Part 1: General requirements

DIN EN 60309; 2007-11, VDE 0623-1:2007-11, Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements

DIN EN 61000-6-2; 2006-03, Electromagnetic compatibility (EMC) - Generic standards - Immunity for industrial environment

DIN EN 61000-6-4; 2007-09**,** Electromagnetic compatibility (EMC) - Generic standards - Immunity for industrial environment

Responsible person for the documentation:
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Römheld GmbH
Friedrichshütte
Laubach, 28.09.2012

4 Index

A

Accessory 8, 17
Application 4, 12

B

Basic information 2, 11

C

Check the safety devices....4, 12
Cleaning....7, 15

D

Daily checks....7, 15
Declaration of manufacture....8
Description....1, 10
Design....5, 13
Disposal 8, 17

E

EC-Declaration of conformity....17
Electro-mechanical version....9

F

Fixing of the product 5, 13

G

General safety tips....2, 11

I

Installation....5, 13
Intended use 4, 12

L

Lifting and lowering....15
List of the applied standards....9, 17
Lowering 6

M

Maintenance 7, 15
Manual-hydraulic version....1
Misapplication 4, 12
Mounting of the customer's connecting construction 5, 14

O

Operation 6, 14

P

Personal protective equipment 3, 11
Plan for maintenance....7, 15

R

Repair 8, 16

S

Safety devices 3, 11
Safety instructions 2, 11
Service life 15
Start up 6, 14
Symbols and signal words....2, 10

T

Table of contents 1, 9
Technical characteristics 8, 16
Trouble shooting....8, 16

W

Warning....3, 11

Y

Yearly checks 7, 16